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**Effects of lockdown on the relationship between body image and self-efficacy:  
the mediation role of resilience**

**Effetti del lockdown sulla relazione tra immagine corporea e auto-efficacia: il  
ruolo mediatore della resilienza**

*di*

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**Abstract**

The measures aimed to contain the 2019 coronavirus pandemic (COVID-19) led to social distancing and limitation of exits also at didactic level. Physical movement has been drastically limited or interrupted, with important consequences on mental and physical well-being. It can thus have a negative effect on body image, especially as concerns younger population leading to a low level of self-efficacy and self-esteem, which strongly influences school performance, especially in women. We examined the relationship between the self-perception of the body image and the perceived level of self-efficacy during the pandemic. Furthermore, we investigated the mediating role of coping strategies and resilience in this relationship. Participants (N = 280, M age = 28.11 years) completed questionnaires concerning body image, self-efficacy, coping strategies and resilience. A Statistical analysis was conducted to examine the relationship among the variables. The analysis

showed that the self- perception of body image, coping strategies and resilience affect self-efficacy, in particular emotional and relational self- efficacy and a mediation role of relational resilience have been detected. Our findings are consistent with literature and they are the first step of a longitudinal study with the aim to give a contribution to the definition of psycho-educational programs to support self-efficacy and academic performance in students.

**Keywords:** body image, self-efficacy, physical activity, coping strategies, resilience.

### **Abstract**

Le misure atte a contenere la pandemia da coronavirus (COVID-19) hanno portato al distanziamento sociale e alla limitazione delle uscite anche a livello didattico. Il movimento fisico è stato drasticamente limitato o interrotto, con importanti conseguenze sul benessere fisico e mentale. Questo può avere un effetto negativo sull'immagine corporea, soprattutto sulla popolazione più giovane, portando a un livello più basso di autoefficacia e autostima, che influenza pesantemente i risultati scolastici, soprattutto nelle donne. Abbiamo esaminato la relazione tra l'autopercezione dell'immagine corporea e il livello percepito di autoefficacia durante la pandemia. Inoltre, abbiamo analizzato il ruolo mediatore delle strategie di coping e della resilienza nella relazione. I partecipanti (N = 280, M età = 28.11 anni) hanno completato i questionari su immagine corporea, autoefficacia, strategie di coping e resilienza. È stata condotta un'analisi statistica per definire la relazione tra le variabili. L'analisi mostra che percezione dell'immagine corporea e, strategie di coping e resilienza hanno un effetto sull'autoefficacia, in particolare l'autoefficacia emozionale e relazionale, con un effetto mediatore della resilienza relazionale nella relazione. Questi risultati sono in linea con la letteratura e rappresentano il primo step di uno studio longitudinale che ha lo scopo di fornire un contributo alla definizione di programmi psico-educativi per supportare l'autoefficacia e i risultati accademici.

**Parole chiave:** immagine corporea, autoefficacia, attività fisica, strategie di coping, resilienza.

### **1. Introduction**

The world has been facing a global public health crisis for the last three months, as the coronavirus disease 2019 (COVID-19) emerges as a menacing pandemic. Nations have locked down to implement social distancing and used isolation as a measure to contain the spread of infection. This social isolation leads to chronic loneliness and boredom, which if protracted long enough, can have detrimental effects on physical and mental well-being (Banerjee & Rai, 2020). Many opportunities to be physically active have been suspended (Hall et al., 2020) with potential consequences for children and adults. As a matter of fact, physical inactivity can have a negative effect on body image, especially in younger population (Gaddad et al., 2018) with severe consequences in self-efficacy and academic achievement (D'Amico & Cardaci, 2003). In older adults the greater sedentary time, can lead to the increased risk of ill-health and poor wellbeing when associated with isolation (Schrempft et al., 2019; Herbolsheimer et al., 2018). Low indoor and outdoor physical activity was associated with being socially isolated from family, friends and neighbours

(Herbolsheimer et al., 2017). A study conducted in Australia during the early phase of physical isolation and transition to online learning showed that energy intake in female students was increased and physical activity levels in both males and females were reduced compared with students in the previous two years, and these changes may persist for a long time, even when measures are eased (Gallo et al., 2020). Among university students, these restrictions have also caused a tremendous level of stress of uncertain future (Al-Rabiaah et al., 2020). This stress may lead to unfavourable effects on the learning and psychological health of students. Taking all of these considerations into account, it seems appropriate to us to research on the effects of isolation on physical and mental health with the aim to define psychoeducational programs to be implemented in schools and university. Our study investigates the relationship between body image, self-perception and perceived level of self-efficacy during lockdown measures. The role of coping strategies and resilience into this relationship has also been inquired.

## **2. The relationship between body image and physical activity**

Body image is a multi-faceted phenomenon that can be defined as the psychological experience of one's own body (Fisher, 1990). Cash (2012) describes body image as an attitude towards the physical self and includes cognitive, evaluative and behavioural elements. According to cognitive-behavioural model of body image (Thomas F. Cash & Fleming, 2002), the construction of the body image is due to a combination of activating and historical (predispositions or past experiences) events. For what concerns the promotion of body image, the situation is rather complex. This issue is often conceptualized as the absence of negative features (Wood-Barcalow et al., 2010), but this definition is rather reductive, as the absence of a pathology does not always mean that it is not necessarily flourishing (Seligman & Csikszentmihalyi, 2000). It is therefore of fundamental importance to foster positive body image since this represents a preventive factor in promoting and enhancing self-esteem and self-efficacy, which are both two important constructs of individual well-being, together with healthy behaviours. One factor that can be preventive or therapeutic in this area is the physical activity. The scientific literature defines a good correlation between physical activity and body image, having positive incidence on body image satisfaction and perceived body attractiveness (Altıntaş et al., 2014), as well as on body perception as an element of global self-esteem (Mariani et al., 2019). Furthermore, Gaddad et al. (Gaddad et al., 2018) found out that increasing in sedentary lifestyle was correlated with a decrease in body image perception.

## **3. The influence of body image on self-efficacy and academic achievement**

The construct of body image directly affects self-assessment and consequently self-efficacy. The self-efficacy was defined as the “beliefs in one's capability to organize and execute the courses of action required to manage prospective situations” (Bandura, 1997) and refers to the specific assessments of a person's ability to perform a task or both the students' ability to learn in general or in a specific topic (Schunk, 1989). The self-efficacy can determine changes for what concerns health behaviour, the lavished energy, and the persistence when facing obstacles and failures (Luszczynska & Schwarzer, 2005); on the contrary, people with low level of self-efficacy are less incisive in their projects (Lent et al., 1984). In addition, Bandura (1997) underlines the importance of socialization experiences in the growing of self-efficacy as well as McAuley (1995) emphasizes the influence of these experiences in the development of body image. Therefore, we can deduce that

the socialization experiences that influence body image have the same impact on self-efficacy. Many studies assert that high self-efficacy is linked to high academic achievement (Sucuoğlu, 2018). Furthermore, academic motivation and grade goals are higher in self-efficacious students than in low self-efficacious ones (Alafgani & Purwandari, 2019; Skaalvik & Skaalvik, 2004). The influence of body image on self-efficacy has been widely demonstrated (Pikler & Winterowd, 2003; Williams & Cash, 2001). In general, women with higher levels of body image also have higher levels of self-efficacy and greater self-confidence (Pikler & Winterowd, 2003). The functioning of this process was individuated by McAuley et al. (1995): the increased exercise improved subjects' body image, which in turn increased the individuals' general self-efficacy. Similarly, poor body image may lower self-efficacy, negatively affecting academic achievement in women (D'Amico & Cardaci, 2003). The research conducted by Tallat et al. (2017) clearly shows that most college students in the sample, aged 18-30 years, were concerned with their physical appearance but the ones with higher grade achievements had less influence and distress because of their body image.

#### **4. The role of coping strategies and resilience in body image perception and self-efficacy**

Coping strategies refer to the way one responds to and handles challenging and stressful situations. Coping style can be one of the factors that influence your response to upward body confrontations. It can be adaptive or non-adaptive (Schnider et al., 2007). The adaptive strategies include all behaviours that tend to overcome difficulties or negative situations. The non-adaptive ones are the avoidance of decisions and actions, or the escape from the situation (Mahmoud et al., 2012). Avoidant coping strategies seems to be linked to negative body image only in a small number of studies and also adaptive coping strategies seems not to be correlate to higher body image (Thomas F. Cash et al., 2005; Sulkowski et al., 2011). The research by Pinkasavage et al. (2015) shows that women with a coping strategy as positive reframing have a weaker relationship between the perception of an “upward” body model in comparison with her body image, and thus lower body dissatisfaction compared to women with different strategies. On the contrary, women with a strong use of self-blame and self-distraction in response to negative events show a stronger relationship with body image concerns. These results are consistent with data coming from Koff and Sangani's research (1997), where a higher use of emotion-oriented coping was associated with a more negative body image, and high task-oriented coping was not related to negative body image. Both coping strategies and self-efficacy contribute to understand the issue of resilience, which can be defined as a process that contributes to effective coping with adversities (Benight & Cieslak, 2011). ŞahiN and Hepsöğütü (2018) state that resilience is the ability to endure the existence of adverse life experiences and that it is predictive of human behaviour in different contests (Bandura, 1997). This derives from a combination of biological, psychological, social and cultural factors. The coping strategies can have a positive or negative impact on resilience (Chen et al., 2018). Furthermore, Karatas and Cakar, (2011) found out that the factors that influence the development of resilience in adolescence are self-esteem, self-efficacy, capacity of adaptation, and flexibility. Furthermore, the relationship between resilience and body image has also been explored. The study by McGrath et al. (2009), regarding a sample of college women, indicates that a higher level of resilience is associated with improved body image. For the purposes of this study, it is important to remember that some studies show a correlation between resilience and coping strategies, which are positive in the case of adaptive strategies, and negative when no adaptive ones are applied (Mariani

et al., 2020; Chen et al., 2018). Considering the wide theoretical perspective presented, the following hypothesis were defined: the individual characteristics, body-self relations, coping strategies and relational resilience affect emotional and relational self-efficacy (H1). Furthermore, it is supposed that the relational resilience mediates between appearance evaluation and emotional and relational self-efficacy (H2).

## 5. Participants

Altogether, since March the 22nd for 2 months, 335 complete questionnaires were collected among university students recruited via university online virtual learning environment and its social media channels, but there were no incentives for participation, and informed consent was provided by all the respondents. After data cleansing and the control for outliers, a sample of 280 respondents were considered in the statistical analysis. Although all the respondents were university students, sample demographic characteristics resulted heterogeneous, in particular 86.1% were female, the mean age was 28.11 (SD =7.28), and regarding the education level the median was high school diploma, the first grade of the ordinal scale (ranging till MA degree). The presence of a considerable difference in proportion between male and females in the sample suggested checking whether the two groups were equivalent for what concerned the demographic variables, i.e. age, level of education, and occupation. For this reason, a series of inferential test of difference/independence were run assuming the Gender variable as grouping factor to evaluate statistically significant differences in the sample, hence assessing the bias in male's numerosity compared to females. As a matter of fact, coincidentally, none of these independent sample t-test and Chi-square test of independence resulted statistically significant (Age  $t(278) = -1.828, p=.07$ ; Level of Education  $\chi^2(4) = 4.034, p = 0.133$ , Occupation  $\chi^2(4) = 4.828, p = 0.305$ ), therefore the subsequent data analysis were conducted just taking note of this sample bias on gender proportion, but without adjusting procedures.

## 6. Measures

**The Scale of perceived self-efficacy in managing complex problems (PSE-MCP)** (Avallone et al., 2007) provides four distinct scores for each subject, in relation to four dimensions of the self-efficacy construct; this was specifically chosen considering that the Covid-19 emergency confronted people with complex and unforeseen situations. The four facets were the following:

- *Emotional maturity* (EM) concerns people' beliefs about their own abilities to deal with stressful situations, or to deal with unforeseen situations, or to have a sound self-control over difficult events and situations.
- *Finalization of the action* (FA) regards beliefs that people have about their own ability to set themselves concrete and achievable objectives, in order to prioritise and to adapt them to their own competencies and to pursue the objectives established.
- *Relational fluency* (RF) is the belief that people have about their own abilities to interact and engage others; to give and ask for help, to maintain good relationships with others, and to manage interpersonal conflicts.
- *Context analysis* (CA) refers to people's beliefs about their own abilities to "read" the context in which they are operating by capturing the links between the different events and

situations; to understand the demands that come from the people of the environment and to use a language adapted to the different circumstances.

**The Multidimensional Body-Self Relations Questionnaire – Appearance Scales (MBSR-AS)** (Thomas F Cash, 2000) consist of the following subscales: Appearance Evaluation, Appearance Orientation, Overweight Preoccupation, Self-Classified Weight, and the Body Area Satisfaction Scale, which assess only appearance-related aspects of body image. Previous literature presented evidence that supports the consistent psychometric properties of the MBSRQ and supported its effectiveness with non-clinical students and community samples (Thomas F. Cash, 2017). In details, the five scales consist of (Thomas F Cash, 2000):

- *Appearance evaluation* (AE) entails feelings of physical attractiveness or unattractiveness; satisfaction or dissatisfaction with one's looks. High scorers feel mostly positive and satisfied with their appearance while low scorers have a general unhappiness with their physical appearance.
- *Appearance orientation* (AO) encompasses the extent of investment in one's appearance. High scorers place more importance on how they look, pay attention to their appearance, and engage in extensive grooming behaviours.
- *Overweight preoccupation* (OWP) assesses a construct reflecting fat anxiety, weight monitoring, dieting, and food restraint.
- *Self-classified weight* (SCW) reflects how one perceives and labels one's weight, from very underweight to very overweight.
- *Body areas satisfaction scale* (BASS) is similar to the *Appearance Evaluation* subscale, except that the BASS takes satisfaction with discrete aspects of one's appearance. High composite scorers are generally content with most areas of their body. Low scorers are unhappy with the size or appearance of several areas.

**The Adult Resilience Measure revised (ARM-R)** (Jefferies et al., 2019) is a self-report measure of social-ecological resilience (Ungar, 2012). This is a psychometrically reliable tool (Liebenberg & Moore, 2018) that consists of 17-items and it is scored on 3- or 5-point Likert scales, where the item-scores are added in order to produce an overall score of resilience. In addition, two subscales can be evaluated, relatively: one for personal resilience, and one for relational resilience. On the one hand, the Relational Resilience takes into account the elements associated with the relevant relationships, either a partner, or the family, or a primary caregiver. On the other hand, the Personal Resilience includes intrapersonal and interpersonal elements.

**The Brief Cope** (Carver, 1997), as its name suggests, is renown in the scientific literature as measurement tool that benefits from a synthetic measurement of the construct assessing several responses known to be relevant to effective and ineffective coping. The theoretically based approach implemented by the authors (Carver et al., 1989) produced a multidimensional coping inventory that allows to assess the different ways in which people respond to stress. Although it is not possible to derive a single composite index, two different components can nevertheless be individuated. More specifically, the first one adds the scores of adaptive strategies in the Approach Coping (APC) (Active-coping, Emotional support, Use of informational support, Positive reframing, Planning, Acceptance), while the second component is the Avoidant Coping (AVC),

which consists of the scores of dysfunctional strategies (Self-distraction, Denial, Substance use, Behavioural disengagement, Venting, Self-blame). Considering that previous literature highlighted two ambiguous items (Humor and Religion that loaded on both the approach and avoidant coping components), these have thus been excluded from further analyses.

## 7. Data Analysis

All the statistical analysis were conducted using JASP software version 0.12.2 (JASP Team, 2020). Initially, two standard multiple regressions were used to separately predict the Emotional Maturity and the Relational fluency, which are considered the most relevant self-efficacy dimensions during covid-19 emergency, and are associated to the “stay-at-home order”; moreover, they are based on multiple independent variables, in this case: Age, Gender, Appearance Evaluation, Relational Resilience, APC and AVC, consequently determining the overall fit (variance explained) of the model and the relative contribution of each of the predictors to the total variance explained (H1). Lastly, a simple mediation analysis has been performed assuming Relational Fluency and Emotional Maturity as the outcome variables (endogenous), Appearance Evaluation as the predictor variable (exogenous), and Relational resilience as the mediator variable (H2).

## 8. Results

Initially, the first multiple regression was run to predict Emotional maturity (dependent variable DV) from Gender, Age, APC, AVC and Relational Resilience (H1). It has been noticed linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. It also has been observed independence of residuals, as assessed by a Durbin-Watson statistic of 1.900. Moreover, homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values, has been detected. It is observed just little evidence of multicollinearity, as assessed by average VIF >1 and average tolerance <0.1. There have been no studentized deleted residuals greater than  $\pm 3$  standard deviations, and values for Cook's distance above 1. The assumption of normality was met, as assessed by a Q-Q Plot. The multiple regression model statistically significantly predicted Emotional Maturity,  $F(6, 273) = 29.25$ ,  $p < .001$ ,  $\text{adj. } R^2 = .378$ . All variables added statistically significantly to the prediction ( $p < .05$ ), excluded the Gender. Regression coefficients and standard errors can be found in Figure 2 (below).

Model		Unstandardized	Standard Error	Standardized	t	p
H <sub>1</sub>	(Intercept)	2.822	2.674		1.055	0.292
	Gender	-0.534	0.595	-0.043	-0.898	0.370
	Age	0.137	0.029	0.230	4.743	< .001
	APC	2.048	0.506	0.205	4.047	< .001
	AVC	-2.751	0.610	-0.225	-4.506	< .001
	AE	1.547	0.297	0.262	5.207	< .001
	Relational resilience	0.196	0.043	0.231	4.519	< .001

Figure 2 - Regression Coefficients – DV Emotional maturity

The second multiple regression was run to predict Relational Fluency from Gender, Age, APC, AVC and Relational Resilience (H1). There was linearity as assessed by partial regression plots (excluded for AVC) and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 2.056. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There was little evidence of multicollinearity, as assessed by average VIF >1 and average tolerance <0.1. There were no studentized deleted residuals greater than  $\pm 3$  standard deviations, and values for Cook's distance above 1. The assumption of normality was met, as assessed by a Q-Q Plot. The multiple regression model statistically significantly predicted Relational fluency,  $F(6, 273) = 21.12$ ,  $p < .001$ , adj.  $R^2 = .302$ . In this case only three variables resulted statistically significantly (improved the prediction for  $p < .05$ ), i.e. APC, AE and Relational resilience. Regression coefficients and standard errors can be found in Figure 3 (below).

Model		Unstandardized	Standard Error	Standardized	t	p
H <sub>1</sub>	(Intercept)	2.503	2.651		0.944	0.346
	Gender	-1.127	0.590	-0.096	-1.911	0.057
	Age	0.027	0.029	0.048	0.936	0.350
	APC	1.329	0.501	0.142	2.650	0.009
	AVC	-0.024	0.605	-0.002	-0.039	0.969
	AE	0.937	0.294	0.170	3.183	0.002
	Relational resilience	0.324	0.043	0.409	7.551	< .001

Figure 3 - Regression coefficients DV Relational fluency

While previous analysis was focused on establishing if there were associations between variables (and the strength of this relationship), the mediation procedure utilized to test third hypothesis (H2) aims to explain how/why it happens. In this case, starting from results of the regression analysis that confirmed a link among AE, Relational resilience, APC and AVC, we modelled the interaction of these relevant constructs (a decomposable model that can be also broken down into meaningful subsets). The path plot observable in Figure 4 outlines the roles of each variable and their relations (AE is the predictor variable, Relational resilience is the mediator variable, the Relational Fluency and the Emotional Maturity are the outcome variables, and Age and Gender are the confounding variables of the background). The arrows indicate the following effects:  $\tau$  is the direct effect of Predictor on Outcomes, and  $\alpha \cdot \beta$  is called the indirect effect. The total effect is the sum of the direct and the indirect effect: mediation analysis decomposes an existing effect into these two terms.

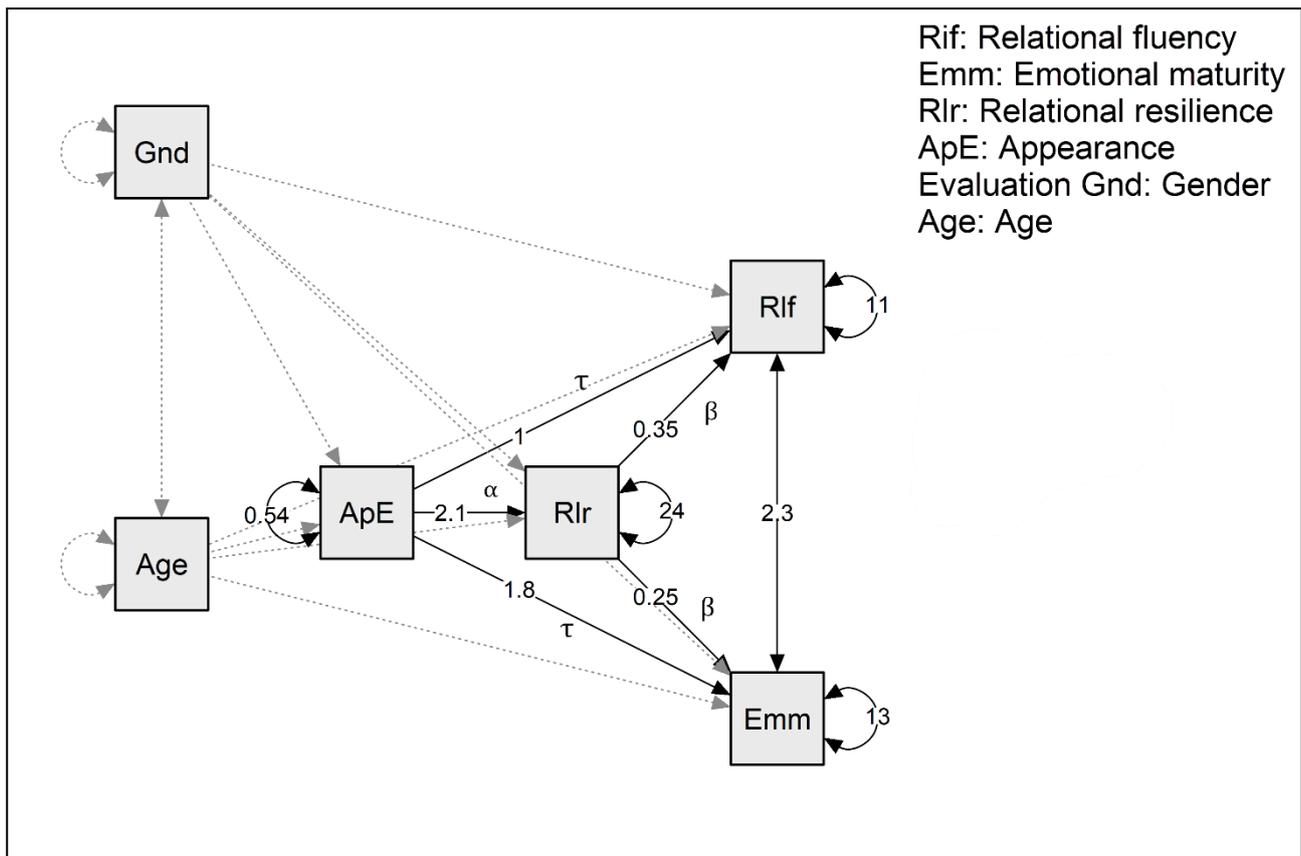


Figure 4 - Path Plot – Mediation model

The total effects of the model are statistically significant in predicting the outcome variables; AE-Relational Fluency  $z = 5.705$ ,  $p < .001$ , 95% CI = 1.107, 2.429; AE-Emotional Maturity  $z = 7.663$ ,  $p < .001$ , 95% CI = 1.600, 2.971). Subsequently, from Figure 5, using the bootstrap confidence intervals, the presence of a statistically significant mediation in this model can be confirmed: the 95% CIs of the indirect effects are (0.450, 1.108; 0.289, 0.855;  $p < .001$  bootstrap confidence intervals were preferred to Sobel Test (Biesanz et al., 2010)), which do not include 0. Since there are only significant interactions in this model, there is no need to interpret the separate main effects of either our IV or our moderator, i.e. both the direct effect and indirect effect are positive. The dimension of the effect of mediator in the model is relatively small  $R^2 = 0.092$ , although statistically significant.

	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper
AE → Relational resilience → Relational fluency	0.729	0.164	4.452	<.001	0.450	1.108
AE → Relational resilience → Emotional maturity	0.519	0.134	3.860	<.001	0.289	0.855

Note. Delta method standard errors, bias-corrected percentile bootstrap confidence intervals, ML estimator.

Figure 5 – Mediation analysis - Indirect effects

Finally, Figure 6 presents the direct effects of Appearance Assessment on outcome variables and can be interpreted as a relationship only partially mediated through Relational Resilience, as the effect persists.

			Estimate	Std. Error	z-value	p	95% Confidence Interval	
							Lower	Upper
AE	→	Relational fluency	1.037	0.290	3.575	< .001	0.455	1.641
AE	→	Emotional maturity	1.831	0.304	6.019	< .001	1.045	2.444

*Note.* Delta method standard errors, bias-corrected percentile bootstrap confidence intervals, ML estimator.

**Figure 6 – Mediation analysis - Direct effects**

## 9. Conclusions

Overall results support the hypothesis that individual characteristics, body-self relations, coping strategies and relational resilience affect emotional and relational self-efficacy. The mediation role of relational resilience on relational fluency and emotional maturity was observed, suggesting that there may be additional mediators to be discovered. Besides, relational resilience, together with APC and AE, seem to predict both emotional maturity and relational fluency, which represent two important self-efficacy dimensions during the Covid-19 period. Age and AVC, instead, seem to be significant predictors only of emotional maturity. We collected data during Covid-19 emergency and cross-sectional study designed at the present moment does not allow to interpret the results in a causal perspective. However, the opportunity to collect a second wave of data on the same sample has been fixed in six months, in order to investigate the size of the impact of inactivity on body image and on all other variables considered. Future research should investigate the long-term impact of the body-self relations, resilience and coping strategies, including the possibility of strengthening individual protective factors implementing a specific psycho-pedagogical protocol. Considering its mediation role and the predictive function on emotional maturity and relational fluency, the protocol should include interventions aimed to foster relational resilience and adaptive coping strategies. As a matter of fact, also adaptive coping strategies are predictors of the two dimensions. At the moment, no empirically validated theoretical framework exists for resilience interventions (Helmreich et al., 2017) and, according with our evidences, it is important to work on enhancing the factors that feed relational resilience. As stated by Helmreich (2017), potential interventions should address different factors of resilience, as, for example, the social support in organizing group sessions for focusing on one’s current network and its enhancement; or the active-coping, introducing the problem-solving model and active-coping strategies in stressful situations; or self-efficacy, supporting participants in identifying personal resources as social connections. The group-based interventions do have the strength to enhance the participants’ social resources (Vanhove et al., 2016).

## Author contributions

AMM designed and conducted the study. AMM conducted the literature searches and provided the acquisition of the data and FMM overlooked methods and undertook the statistical analyses. FPC wrote the introduction, AM and FMM wrote the conclusions. All authors significantly participated in interpreting the results, revising the manuscript, and approved its final version.

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